

REMARKS/ARGUMENTS

Favorable reconsideration of this application, in light of the present amendments and following discussion, is respectfully requested.

Claims 4-9, 11, 12, and 14 are pending in the present application, Claims 4, 5, and 9 are amended, new Claim 14 is added, Claims 11 and 12 are withdrawn, and Claims 2, 3, and 13 are canceled without prejudice or disclaimer. Claims 4, 5, and 9 are amended to change the dependency from Claim "13" to Claim "14," and to be consistent with new Claim 14. Support for new Claim 14 is found, for example, in original Claims 1, 2, 3, and 10, and in the specification at pages 12-16. It is respectfully submitted that no new matter is added.

In the outstanding Office Action, the claims of the present application were subjected to a restriction requirement; Claim 13 was rejected under 35 U.S.C. §112, second paragraph; Claims 13 was rejected under 35 U.S.C. §112, first paragraph; and Claims 13 and 2-9 were rejected under 35 U.S.C. §103(a) as unpatentable over Hartman (U.S. Patent No. 5,224,166) in view of Alexander (U.S. Patent No. 6,188,602).

With respect to the restriction requirement, Applicants affirm that on January 30, 2006 a provisional election was made to prosecute Group I, Claims 2-9 and 13.

With respect to the rejection of Claim 13 under 35 U.S.C. §112, first and second paragraphs, Applicants respectfully submit that the cancellation of Claim 13 renders these grounds of rejection moot.

In a non-limiting embodiment of the claimed invention, a microprocessor executes a new program including plaintext instructions and encrypted instructions. A processor core executes a key registration instruction for carrying out a key registration.¹ As part of the execution of the key registration instruction, a registration request with an address of a distribution key of the new program and a program identifier that identifies the new program

¹ Specification, page 13, lines 17-19.

is issued to a key management unit.² The distribution key is obtained in advance by encrypting an instruction key specific to the new program by using a public key corresponding to a secret key specific to the microprocessor. *After the registration request is issued, the processor core executes instructions of another program during the key registration by the key management unit.*³ As described in the specification, the registration operation is carried out in parallel to the processor core executing another program.⁴

The key management unit receives the key registration request, and carries out the key registration and waits for a completion of an invalidation of a cache line.⁵

In the key registration, the key management unit reads out the distribution key from an external memory based on the address of the distribution key and uses the secret key to obtain the instruction key. The key management unit registers, into a key table, the instruction key in correspondence to the program identifier sent from the processor core.⁶

In the invalidation of a cache line, the key management unit invalidates the cache line stored in correspondence to the same program identifier of the new program on the cache memory.⁷

When the key registration and the invalidation are both completed, the key management unit notifies the completion of the key registration to the processor core asynchronously by interruption.⁸

After receiving the notification of the completion of the key registration from the key management unit, the processor core starts to execute the new program with respect to the registration request by using the corresponding instruction key.⁹

² Specification, page 13, lines 21-33.

³ Specification, page 16, lines 10-12.

⁴ Specification, page 14, lines 10-12.

⁵ Specification, page 14, line 15 to page 15, line 14.

⁶ Specification, page 14, line 22 to page 15, line 3.

⁷ Specification, page 15, lines 4-6.

⁸ Specification, page 16, lines 14-17.

⁹ Specification, page 16, line 23.

New Claim 14 recites, *inter alia*,

a processor core configured to...execute instructions of another program during a key registration...

a key management unit configured to...carry out key registration...the invalidation being carried out by invalidating the cache line stored in correspondence to the program identifier on the cache memory when the instruction key corresponding to the program identifier is registered....

Applicants respectfully submit that Hartman and Alexander do not disclose or suggest at least these elements of Claim 14.

The outstanding Office Action, at pages 8-9, takes the position that multi-tasking is a commonly used technique that would be an obvious design practice for a software engineer. However, Applicants respectfully submit that Claim 14 is not directed toward multi-tasking.

The parallel operation by the processor core and the key management unit is not multi-tasking. Multi-tasking is a technique in which one processor sequentially suspends a program, and then selects and executes another program selected from among plural programs according to some event, for example. Thereby, there is the appearance that the plural programs are executed at the same time. However, only one program is instantaneously executed.

In contrast, according to the claimed invention, the processor core and the key management unit execute their respective tasks in parallel. Additionally, the key registration and the invalidation of a cache line in the key management unit are also carried out in parallel.

Furthermore, Applicants respectfully submit that having the processor core and the key management unit execute their respective tasks in parallel is not an obvious design choice. As disclosed in the specification, "there is an effect of improving performance by

enabling the execution of another program...during the registration operation.”¹⁰ It is well established that when particular claimed features are disclosed as solving particular problems and providing advantages, as in the present specification, the doctrine of design choice cannot be relied upon as a substitute for a clear and convincing showing of motivation that would logically have led the artisan to have made the proposed modification. See In re Chu, 36 USPQ2d 1089, 1094 (Fed. Cir. 1995).

In view of the above-noted distinctions, Applicants respectfully submit that Claim 14 (and Claims 3-9 dependent thereon) patentably distinguish over Hartman and Alexander, taken alone or in proper combination.

Page 2 of the outstanding Office Action states that no claim for priority has been made in this application. Applicants respectfully traverse this position. A request for priority, along with a copy of the priority document, was filed on January 31, 2002. This is evidenced by the attached copy of the date stamped filing receipt. Applicants respectfully request that the next Office Communication indicate that a claim for foreign priority has been made and that a copy of the priority document has been received.

Applicants respectfully direct the Examiner’s attention to the Information Disclosure Statements filed September 3, 2003 and September 14, 2004. Applicants note that these Information Disclosure Statements have yet to be indicated as considered by the Examiner. As such, Applicants respectfully requests that the Examiner provide initialed 1449 forms in the next communication.

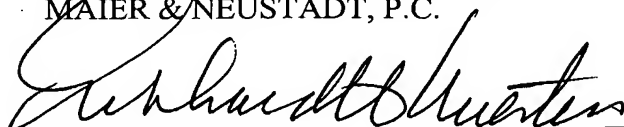
¹⁰ Specification, page 16, lines 10-12.

Application No. 10/059,217
Reply to Office Action of February 14, 2006

Consequently, in view of the foregoing discussion and present amendments, it is respectfully submitted that this application is in condition for allowance. An early and favorable action is therefore respectfully requested.

Respectfully submitted,

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OSMM&N File No. 218943US2RD

Serial No. NEW APPLICATION

In the matter of the Application of: Mikio HASHIMOTO, et al.

For: MICROPROCESSOR USING ASYNCHRONOUS PUBLIC KEY DECRYPTION PROCESSING

The following has been received in the U.S. Patent Office on the date stamped hereon:

☒ 42 pp. Specification 12 Claims/Formal Drawings 16 Sheets
and 3 Pages Application Data Sheet

☒ Combined Declaration, Petition & Power of Attorney 4 pages

☐ List of Inventor Names and Addresses

☒ Utility Patent Application Transmittal

☐ CPA

☒ Request for Priority

☒ Priority Doc (1)

☒ Check for \$740.00

☒ Dep. Acct. Order Form

☒ Fee Transmittal Form

☐ Assignment/PTO 1595 pages:

☐ Letter to Official Draftsman

☐ Letter Requesting Approval of Drawing Changes

☐ Drawings sheets ☐ Formal

☐ Letter

☐ Amendment

☒ Information Disclosure Statement

☒ PTO-1449

☒ Cited References (3)

☐ Search Report

☒ Statement of Relevancy

☒ Cited Pending Applications (3)

☒ IDS/Related/List of Related Cases

☐ Restriction Response

☐ Election Response

☐ Rule 132 Declaration

☐ Petition for Extension of Time

☐ Notice of Appeal

☐ Brief

☐ Issue Fee Transmittal

☒ White Advance Serial Number Card

☐ Small Entity Status is claimed

☐

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Due Date: 01/31/02



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